

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of

Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems

PR Docket No. 93-61

RM 8013

**COMMENTS OF
SOUTHERN CALIFORNIA EDISON COMPANY**

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SUMMARY

Southern California Edison Company ("SCE") is the second largest electric utility in the United States, serving approximately nine million people across a 50,000 square mile expanse. Since 1986, SCE, with the approval of the California Public Utility Commission, has spent \$30 million of ratepayer money to develop a communications network ("NetComm") to automate its distribution system and remotely read its customers' utility meters. The heart of NetComm is a Part 15 spread spectrum radio.

Creation of a Location Monitoring System ("LMS") (as contemplated in the Notice of Proposed Rulemaking in this Proceeding) ("Notice"), may well result in NetComm being inoperable. Furthermore, any LMS system (of the type contemplated in the Notice) may also be inoperable. LMS, as contemplated by the Notice, cannot coexist with SCE's Part 15 device.

Implementation of the proposal contained in the Notice will make SCE's Part 15 radio unusable. It is patently unfair for the Commission to take any action which makes Part 15 devices worthless, particularly after having encouraged investment in such devices. SCE had no warning when it developed, tested and installed such devices, that the Commission was contemplating expanding AVM into LMS over the entire 902-928 MHz band, which would make its investment in NetComm Part 15 radios unusable.

It is infeasible to authorize LMS, as contemplated by the Notice, due to the presence of millions of Part 15 devices currently operating in the 902-928 MHz band. The Commission cannot clear the 902-928 MHz of such devices in order to make room for LMS

because such devices are operated without licenses and without regard to any specific location. The Commission would have to physically remove such devices from virtually every household and business in this country in order to assure that these devices were not operating in this band.

Before authorizing LMS, as contemplated by the Notice, the Commission should satisfy itself that the technology proposed by the Notice will, in fact, be capable of providing LMS. SCE does not believe there is anything in the record which demonstrates that the LMS technology, as contemplated by the Notice, is robust enough to share the 902-928 MHz band with the most senior users of that band.

If SCE is unable to discourage the Commission from authorizing LMS in the 902-928 MHz band, the Commission should only authorize LMS pursuant to such technical standards as will permit Part 15 operations to co-exist with LMS in this band. The Commission would have to issue another Notice of Proposed Rulemaking in order to compile a record sufficient to authorize a LMS which could coexist with Part 15 devices.

LMS, as contemplated in the Notice, cannot share the 902-928 MHz band. SCE believes that sharing has served the American public well, providing a great variety of services to meet a great multitude of radio-based needs. LMS will make it impossible for a whole host of valuable uses of the 902-928 MHz to be provided. In SCE's case, many of these uses result in enormous energy savings and help improve the quality of the environment. Additionally,

NetComm provides a number of health and safety benefits throughout its service area in Southern and Central California.

LMS violates the Communications Act because it is counter to the FCC's statutory mandate to promote the development of new technologies.

Since the radio spectrum currently allocated to automatically read utility meters, manage energy usage, monitor utility system outages and perform related functions is depleted in many parts of the country, including SCE's service area, SCE has no cost-effective choice but to use NetComm Part 15 radios. SCE ratepayers have expended in excess of \$30 million for research and development of NetComm Part 15 radios, and the Commission should not make these radios unusable.

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Southern California Edison Company ("SCE"), by its attorneys, hereby submits its Comments in the above-referenced proceeding. As discussed below, SCE firmly believes that the Commission should seriously consider abandoning its proposal to significantly expand the Automatic Vehicle Monitoring ("AVM") Service to create a new service, with additional spectrum called Location Monitoring Service ("LMS") in the 902-928 MHz band. The status quo should be maintained. Alternatively, SCE believes that LMS should be authorized only pursuant to equipment standards and operating parameters which would permit others, especially Part 15 devices, to operate simultaneously with LMS systems.

I. INTRODUCTION

1. SCE is the second largest electric utility in the nation, serving approximately nine million people across a 50,000 square mile expanse. Since 1986, SCE has been developing, installing and

testing a communications network to automate its distribution system and remotely read its customer's utility meters. This has been no small task because SCE has approximately 4.3 million electric meters scattered across its service area.

2. The communications network which SCE has developed is called the NetComm Data Communications Network ("NetComm"). NetComm is capable of performing many functions, including electrical system distribution automation, load management and automatic meter reading applications, and is the only system currently available which is capable of handling the extraordinarily large number of utility meters in Southern California. These end points consist of about 200 bulk power system control and monitoring points, approximately 800 distribution substations, 30,000 distribution circuit control and monitoring points and roughly 4.3 million electric meters.

3. As part of NetComm, SCE has developed an automated capacitor switching system, or the Distribution Capacitor Automation Project ("DCAP"), for its electric utility distribution circuits. This represents the next generation of conservation voltage regulation that adjusts customer voltage levels to reduce energy consumption.

4. At the heart of the DCAP System is a two-way NetComm packet radio which communicates with new electronic meters. These meters read real-time customer voltages, energy consumption, as well as a host of other customer electrical service parameters used

in customer service and safety-related problem diagnosis. This two-way NetComm packet radio is a spread spectrum Part 15 device. These radios transmit the meter voltage data and capacitor status to SCE's computers for processing. The computers determine what action is required and then -- via the packet radios -- transmit switching signals to operate the capacitors for adjusting voltages. In this way, SCE's computers are capable of remotely determining which capacitors should be switched in order to achieve the best overall customer voltage. DCAP provides conservation voltage regulation benefits for customers and also improves the power transfer efficiency of distribution lines.

5. SCE is presently demonstrating DCAP on 25 circuits from two substations east of Los Angeles -- Hacienda Heights and Villa Park. The total number of packet radios in the NetComm network presently consists of approximately 1500 radios, covering the greater Los Angeles area and surrounding counties. An expansion of the DCAP demonstration is now underway, adding 60 circuits from 17 substations by 1993 year end. This includes the installation of approximately 3,000 additional packet radios, which is now underway. SCE expects to continue to roll-out DCAP on an even larger scale throughout 1994-1995. SCE estimates that as much as one billion kilowatt hours per year can be saved by SCE's customers by utilizing DCAP through its service territory. SCE also estimates the annual customer savings could be as high as \$40 million.

6. DCAP is just one element of SCE's six-part automated distribution system automation program, called the Distribution System Efficiency Enhancement Project ("DSEEP"). The essential element of DSEEP is NetComm. Other components of DSEEP, which will also employ NetComm's Part 15 spread spectrum packet radio equipment, include communications for automated circuit switching, alarm systems for circuit outages, enhanced outage management centers, and substation monitoring and control.

7. Since 1986, the California Public Utilities Commission has approved SCE's expenditure to date of approximately \$30 million of ratepayer money for research and development of the NetComm Part 15 technology.

II. LMS, AS CONTEMPLATED IN THE NOTICE, CANNOT COEXIST WITH SCE'S PART 15 DEVICE IN THE 902-928 MHz BAND

8. SCE understands that the Notice of Proposed Rulemaking in this Proceeding ("Notice") proposes that the North American Teletrac and Location Technologies, Inc. ("Teletrac") system architecture for LMS be the de facto standard for providing LMS in the 902-928 MHz band.

9. Teletrac's Petition, at pages 24-32, explains that its LMS technology is very fragile and will not permit Teletrac to share the 902-928 MHz spectrum. SCE agrees with Teletrac about the fragility of its technology and its inability to share this spectrum; Teletrac's LMS technology appears to be highly

susceptible to interference from co-channel users (including Part 15 devices), making sharing infeasible.

10. Creation of a LMS which makes Teletrac's technology the de facto standard may result in NetComm (and all SCE's systems which NetComm supports) being inoperable in those areas in which a

extremely quiet RF environment. Indeed, such a proposal is inconsistent with statements made by the Commission at the time it was encouraging new Part 15 technology development within the band.

13. In 1984, when the Commission first proposed rules to authorize unlicensed spread spectrum operations, it noted that the 902-928 MHz band appeared to provide an "excellent proving ground" for such operations because of the low probability of interference to licensed services. Although some ISM manufacturers objected to the proposed authorization, the possibility of interference being caused to AVM services was not even mentioned:

The majority of comments favored allowing spread spectrum systems to operate in these bands Although GE and RCA have presented arguments against the shared usage of the ISM bands, we do not feel that they outweigh the considerable advantages to be gained from sharing these bands with spread spectrum systems. If spread spectrum systems can contend with the heavy interference from the other users of the band, then these bands could offer an excellent proving ground for high power spread spectrum applications.
[Emphasis added.]^{1/}

14. In 1985, when the FCC authorized spread spectrum operations in the 902-928 MHz band, the Commission noted that its new rules were being kept "deliberately conservative in order to minimize any possibility of interference to . . . existing

^{1/} Further Notice of Inquiry and Notice of Proposed Rulemaking, Gen. Docket No. 81-413, 98 FCC 2d 380 at 389-90 (1984).

services."^{2/} Later, when the FCC was considering the authorization of additional Part 15 services within the band, the Commission discussed the possibility of interference to ISM services. Again, the possibility of interference to AVM services was not mentioned:

The new frequency bands proposed in this Notice are now allocated primarily for Industrial, Scientific and Medical (ISM) operations under Part 18 of the Commission's

We desire to encourage the development and implementation of this exciting new family of technologies, and therefore seek to provide a regulatory framework in which there is maximum flexibility for the use of spread spectrum systems consistent with the basic precept of Part 15 rules that non-licensed operations are not to cause harmful interference to established services. [Emphasis added.]^{4/}

16. SCE is fully cognizant of the secondary status of Part 15 devices. It also recognizes that the Commission has the discretion and authority to allocate spectrum to new services. However, SCE has a right to expect that any change in the rules affecting the operation of unlicensed Part 15 NetComm packet radios will be based upon reasoned decision making. To the extent the proposals in the Notice result in SCE's \$30 million investment being made unusable, SCE does not believe these proposals are either fair or reasonable.

**IV. THE FCC SHOULD NOT CREATE LMS IN THE FORM REQUESTED BY
TELETRAC IN THE 902-928 MHz BAND**

**A. IT IS INFEASIBLE TO AUTHORIZE LMS, AS CONTEMPLATED BY
TELETRAC, DUE TO THE PRESENCE OF MILLIONS OF PART 15
DEVICES IN THE 902-928 MHz BAND**

16. As noted by the Commission, at paragraph 23 of the Notice, the Commission has authorized Part 15 devices to operate in the 902-928 MHz band. The Commission has, in the last three years, completed a series of rulemakings in conjunction with its rewrite of Part 15 in which it facilitated the expanded use of unlicensed

^{4/} Report and Order, Gen. Docket 89-354, 8 FCC Rcd. 4123 at 4124 (1990).

devices at 902-928 MHz.^{5/} Amateur operations are in this frequency band, too.^{6/} As noted in paragraph 24 of the Notice, not only is there a substantial presence of Part 15 devices in the 902-928 MHz band, that presence is likely to increase substantially as new consumer-oriented Part 15 devices, including the new, one watt, spread spectrum, digital cordless telephones and wireless office systems are introduced.^{7/} These new phones will have greater range and improved privacy over their conventional, analog cordless cousins. Given the widespread acceptance of conventional, analog cordless phones (which are generally considered to be greatly inferior to the new generation of digital cordless phones), there can be no doubt that the introduction of these digital cordless phones will have a major impact on the use of the 902-928 MHz band. In sum, 902-928 MHz is not virgin spectrum; it is inherently a shared band already occupied by a plethora of useful services.^{8/}

^{5/} See n. 2 supra.

^{6/} See 47 C.F.R. § 97.301.

^{7/} The Electronics Industries Association estimates that there are approximately 44.1 million households currently using cordless phones. Recent sales figures indicate that number is increasing.

^{8/} If Teletrac plans to simply increase the number of receive sites to attempt to reduce interference to its LMS system, SCE believes this will result in more interference from NetComm radios and other Part 15 devices. The task of determining the interfering source will worsen with the continued introduction of Part 15 devices, as the source can change minute-by-minute by the nature of their intermittent use; e.g., digital cordless phones.

17. SCE questions the Commission's ability to resolve the interference that is going to occur from Part 15 devices in favor of LMS. SCE also questions how the Commission would implement an order directing the millions of Part 15 devices that are currently in the hands of consumers to cease operations. Part 15 operations are unlicensed and, short of physically removing the offending Part 15 equipment from virtually every home and business in the United States, there is no way to force the offending consumers to cease interfering with Teletrac's technology. In addition, it would be extremely difficult, if not impossible, to determine, on a site-by-site basis, who is operating the interfering Part 15 device.

18. The Commission has created a substantial industry in the 902-928 MHz band with the attendant substantial investment in Part 15 devices by both the American public and manufacturers. SCE's ratepayers are among those members of the American public who have made a substantial investment in Part 15 packet radios. These substantial investments by SCE, as well as many other utilities, are continuing. SCE respectfully submits that any Commission decision to locate LMS in the 902-928 MHz band cannot ignore but, rather, must take into account and allow for the fact that NetComm packet radios and millions of other Part 15 devices are now

B. THE COMMISSION SHOULD SATISFY ITSELF ABOUT THE ROBUSTNESS OF TELETRAC'S TECHNOLOGY BEFORE IT EMBRACES TELETRAC'S TECHNOLOGY

19. The Commission has been made aware, by Teletrac's own statements and engineering exhibits, that Teletrac's system is very fragile.^{2/} Under such circumstances, SCE believes that the Commission must satisfy itself that, if the Commission creates LMS using Teletrac's system architecture, LMS will be robust enough to be useable by the American public.

20. It is not obvious to SCE that Teletrac's system will be able to operate in the presence of co-channel users which have priority in the spectrum, nor is there anything in the record of the proceeding thus far that would help the Commission come to this conclusion.

V. IF THE FCC IS INTENT UPON CREATING LMS IN THE 902-928 MHz BAND, IT SHOULD DO SO ONLY PURSUANT TO SUCH TECHNICAL STANDARDS AS WILL PERMIT PART 15 OPERATIONS TO CO-EXIST WITH LMS IN THIS BAND

21. Teletrac's Petition, at pages 24-32, asks the Commission to give Teletrac exclusive use of the bands at 904-912 MHz and 918-926 MHz by revoking the Commission's AVM spectrum-sharing policies because Teletrac's system is so fragile. The Notice impliedly proposes to grant Teletrac's Petition in this regard. SCE encourages the Commission to seriously consider abandoning its proposal in the Notice because the existing sharing arrangement has

^{2/} See Teletrac Petition at pp. 24-32 and Appendix 2.

worked well (except for Telet rac) and permitted operations in the band by a multitude of users, including Part 15 users. SCE believes the Commission should authorize LMS only on the condition that LMS is able to share the 902-928 MHz band with other licensed services, as well as Part 15 services and devices.

22. The Commission appears to be of this mind. Paragraph 21 of the Notice states: "The Petitioner and some commenters claim that such systems [LMS systems] must be licensed on an exclusive basis (one licensee per band in any one geographic area) to operate effectively and to promote further development of the LMS industry. The record does not appear to support this view We believe it is possible for wide-band pulse ranging systems to operate on a non-exclusive basis, albeit with cooperation among co-channel licensees serving the same area."

23. As noted above, except for Telet rac, the existing sharing arrangement has worked well and permitted operations in the band by a multitude of users, licensed and unlicensed. These users have worked together to solve interference problems in the past and, if the Commission maintains a model for LMS like that which currently exists for AVM, these users will continue to resolve their interference problems. However, the key to successful sharing is designing sufficiently robust equipment that can survive the shared-spectrum environment and that can flexibly accommodate other users as the FCC intended and apparently (see paragraph 21 of the Notice) continues to intend. Every current user of the 902-928 MHz

band has apparently been able to design such robust equipment. SCE believes the Commission should suggest Teletrac to do so also by adopting technical standards that will permit Part 15 operations to co-exist in the 902-928 MHz band.

24. Sharing in the 902-928 MHz band can support, and has supported, numerous applications of both licensed and unlicensed services that meet critical user needs and facilitate important national and local objectives. NetComm and DSEEP are two examples of such applications. As noted above, SCE estimates that as much as one billion kilowatt hours per year could be saved by using DCAP throughout SCE's service area; that is to say, use of this system could result in enormous energy savings if used nationwide. Such savings would increase the United States' energy efficiency, thereby decreasing its dependence on foreign energy supplies, and help the electric utility customer by reducing the average amount of monthly electric bills. In addition, an increase in energy efficiency would decrease the amount of electricity that utilities, such as SCE, need to produce, and, consequently, could help to improve the quality of the environment. Use of NetComm would also result in a number of health and safety benefits. For example, SCE's DSEEP would, in addition to DCAP, consist of alarm systems for circuit outages, enhanced outage management centers, and substation monitoring and control. These functions would be extremely beneficial during emergencies, such as earthquakes and wind storms, to which Southern California is prone, and at other

times when SCE experiences a service outage. SCE will be made aware of outages as soon as they occur, and, consequently, be able to react quickly to the situation and take steps to eliminate any hazards to the public (i.e., cut off power to "live wires").

25. NetComm's ability to continue to provide such a variety of applications will be severely restricted or infeasible if Teletrac is allocated exclusive use of most of the 902-928 MHz band. A flexible use policy is necessary in the 902-928 MHz band in order to minimize the disruption to uses (such as those described above) that, while junior in the user hierarchy, nevertheless serve important functions. Use of DSEEP to remotely read utility meters, manage energy usage, monitor utility system outages, and perform related functions is consistent with this Administration's energy and environmental policies. This Administration has made clear that it intends to increase America's energy efficiency and conservation and improve environmental quality.^{10/} In this regard, and as discussed above, use of NetComm will result in tremendous increases in energy efficiency and conservation, as well as improve the quality of the environment, without the need for costly government regulation or more painful measures.

26. As SCE noted above, before the Commission considers any exclusivity for Teletrac's technology, or any other technology in the 902-928 MHz band, it should determine: (i) if such technology will be able to maintain a reasonable level of electromagnetic compatibility with users currently operating in the 902-928 MHz band; and, (ii) how the Commission will ensure such exclusivity in a band currently in use by millions of unlicensed devices. SCE believes that another Notice of Proposed Rulemaking would be necessary to develop a record to adopt the type of standards SCE has advocated in this part of its Comments.

VI. MAKING TELETRAC'S TECHNOLOGY THE DE FACTO LMS STANDARD VIOLATES THE COMMUNICATIONS ACT

27. As noted, Teletrac seeks exclusive use of the 902-928 MHz band due to the fragility of its system architecture. Such exclusivity is counter to the FCC's statutory mandate to promote the development of new technologies^{11/} because, due to the fragility of the Teletrac system, sharing is infeasible and the

VII. CONCLUSION

WHEREFORE, the premises considered, SCE respectfully requests the Commission seriously consider abandonment of the proposal in the Notice and opt, instead, to maintain the status quo. Alternatively, SCE requests that the Commission permit LMS exclusively by means of technologies which permit NetComm and other Part 15 devices in the 902-928 MHz band simultaneously with LMS. SCE believes that tremendous public benefits can be realized by implementing DSEEP (and the spread spectrum Part 15 packet radios, which is at the heart of the NetComm system) to automatically read utility meters, manage energy usage, monitor utility system outages and perform related functions. Since the radio spectrum currently allocated for licensed types of systems is depleted in many parts of the country, including SCE's service area, SCE has no cost-effective choices but to use Part 15 devices. SCE's ratepayers have expended in excess of \$30 million in research and development for Part 15 spread spectrum radios and the Commission should not make their investment unusable.

Respectfully submitted,

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